42. (canceled) The method of claim 41 wherein said non-magnetic spacer layer is a layer of Cu of thickness between approximately 8 and 30 angstroms.

43. (canceled) The method of claim 42 wherein said non-magnetic spacer layer is a layer of Cu of thickness approximately 19 angstroms.

[[45]]44 (currently amended). The method of claim 26 wherein said specularly reflecting capping layer is a layer of FeTaO formed to a thickness of between approximately 5 and 40 angstroms.

Claims 45-83 are withdrawn

Remarks:

The Examiner is thanked for reading the subject Patent Application. Applicants would like to briefly point out the features of their claimed invention, which is a bottom spin-valve GMR read sensor whose performance is improved by the use of a novel, specularly reflecting capping layer formed by oxidizing an ultra-thin (between 3 and 30 angstroms) layer of FeTa which has been deposited on a layer of non magnetic material. Several other materials can also be oxidized and fulfill the objects of the present claimed invention, such other materials including oxidized Fe or oxidized $(Fe_{65}Co_{35})_{97}V_3$. As Examiner has pointed out, Applicants have discussed prior art in which capping layers have been advantageously used within the methods of forming spin-valve type GMR read sensors. Pinarbasi (U. S. patent No. 6,268,985) has taught the use of such capping layers

to maintain and even improve the magnetic properties of a sensor free layer during annealing steps that migh otherwise degrade such properties. Gill (U. S. Patent No. 6,181,534) has taught the use of a double layer capping layer in which a NiO layer improves the transport properties of conduction electrons through the sensor. The novelty of the present claimed invention is in its use of ultra-thin Fe based oxides, particularly those naturally oxidized) to obtain greater improvements of sensor performance than have previously been obtained as a result of the particular effective degree of specular reflection of conduction electrons (spin conserving reflection) that such chemical compositions provide.

Rejections Under 35 USC 112

Applicants respectfully request reconsideration of the rejection of Claims 1-44 under 35 USC 112 as being indefinite as a result of the parenthetical "NOL" which appears in both claims 1 and 26, by amending both claims to eliminate "(NOL)". NOL is an acronym for "nano-oxide layer" and it refers to an ultra-thin oxidized material capping layer that is the specularly reflecting layer of the present claimed invention. The parenthetical "(NOL)" was inserted merely to symbolically stress the fact that the capping layer is such an ultra-thin oxidized layer and the presence of "(NOL)"was not intended to be a claim limitation. Unfortunately, as the Examiner notes, the placement of "(NOL)" within the claim produces a lack of clarity. In the context of claims 1 and 26, however, it is unnecessary to refer to the layer as a nano-oxide layer, since the chemical composition of the layer as well as the method of forming the layer (ie. its oxidation) and its thickness

are specifically claimed in claims 19-24 and claim 44. Applicants, therefore, can amend both claims 1 and 26 to eliminate the term and the ambiguity it causes without changing the substance of either claim.

Rejections Under 35 USC 103

Applicants respectfully request reconsideration of the rejection of Claims 1-18 and 25-43 under 35 USC 103 as being unpatentable over admitted prior art in view of Gill and of Claims 1-17 and 25-43 over admitted prior art in view of Pinarbasi. The novelty of Applicant's claimed invention is not the capped spin-valve of Pinarbasi or the specularly reflective NiO capping layer of Gill. Pinarbasi's capping layer is intended to protect a magnetically free layer during the annealing process, not to improve spin-valve performance by enhancing the specular reflection of conduction electrons. Gill's NiO capping layer (on a non-magnetic layer) does provide a specularly reflective property, but it does not provide the degree of improvement of the present claimed invention, which is a specific and novel result of the Fe-rich, ultra-thin oxide layer. Applicant's do not believe that one of ordinary skill in the art would find any suggestion or motivation to use the specific ultra-thin FeTa oxide, or its method of formation, based on either Pinarbasi or Gill. It is Applicant's belief that the going from NiO to FeTaO or $(Fe_{65}Co_{35})_{97}V_3$ would require undue experimentation.

Applicants, however, do agree with the suggestion of the Examiner that Claims 19-24 and 44 would be allowable if rewritten to overcome the rejections(s) under 35 USC 112. These claims contain the novel limitations of an ultra-thin, (ie. a nano-layer)

oxidized specularly reflecting capping layer within a spin-valve sensor which is the claimed invention of Applicants. Consequently, Applicants have amended the claims as indicated herein, by canceling all claims but 1, 17-24, 26 and 44, to comply with Examiner's suggestion. In addition, Applicants respectfully request that Examiner also find Claims 17, 18 and 26 allowable for the following reasons. Claims 17 and 18 claim the limitations for the non-magnetic layer on which the oxidized specularly reflecting layer must be formed. Claim 26 claims a second embodiment in which the oxidized specularly reflecting layer need not be formed on a first non-magnetic layer. Allowable Claim 44 (which, by typographical error was entered originally as Claim 45) depends from Claim 26

The Examiner is thanked for thoroughly reviewing the application. All claims discussed above are now believed to be allowable. If the Examiner has any questions regarding the above application, please call the undersigned attorney at 845-452-5863

Respectfully submitted,

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